

The Heart Beats On!

Suggested Age / Grade Level	Concepts Covered
Grades 3 - 8	<ul style="list-style-type: none">• Blood Components• Circulatory System – How the heart pumps blood• Arteries and Veins differences• Radial and Carotid artery pulse

Overview

The way blood moves through our body and reaches even our toes is an interesting approach to looking at how things move inside of us. The heart is a very important organ and this activity will get the students thinking about what blood really is, how the heart and the circulatory system works to move blood around our body, as well as the differences between veins and arteries. Lastly, they will learn about the radial and carotid artery and how to measure their radial and carotid pulse. They will also see how heart rate is affected by exercise.

Learning Goals

- To learn about what blood is made up of
- To learn about how blood moves throughout the body or the components of the circulatory system
- To learn about the differences between veins and arteries
- The important role that the heart plays in moving blood
- What pulse is and how to measure heart rate, how exercise affects heart rate

Key Terms

Red Blood Cells - Cells in our blood that carry oxygen all around our body. Red blood cells and oxygen together give blood its dark red color.

White Blood Cells - Cells that roam around in our blood to fight and protect us from outside invaders that do not belong in our bodies, like viruses and bacteria.

Platelets - Cells in our blood that help to quickly seal up a wound, so we do not lose a lot of blood.

Plasma - The yellowish fluid that makes up the most of our blood. Plasma helps carry red blood cells, white blood cells, platelets, other nutrients and proteins all around the body, especially to the places that need it most.

Atrium/Atria - One of the chambers of the heart. There is a right atrium and a left atrium. These chambers are where blood enters the heart from the body or lungs.

Ventricles - One of the chambers of the heart. There is a right ventricle and a left ventricle. These chambers are where blood exits the heart into the body or lungs.

Valves - Separate the atrium and the ventricle from each other. They remain closed to allow blood to fill up in the atrium and open to let the blood flow into the ventricles. They remain closed to prevent blood from going backwards, so blood only flows from the atrium to the ventricle.

Activity Timeline

Activity	Time
Introduction to Blood Components <ul style="list-style-type: none"> ● Red Blood Cells ● White Blood Cells ● Platelets ● Plasma 	5 minutes
Activity - Creating a Pumping Heart Model	30 minutes
Discussion <ul style="list-style-type: none"> ● What does each component in our model represent? ● Comparing the components of our model to the actual heart ● Introducing the Atria, Valves and Ventricles ● Some troubleshooting tips if the model is not working 	5 minutes
Discussion <ul style="list-style-type: none"> ● The overall picture of how the blood moves around our body ● Introducing the heart/cardiac cycle 	5 minutes
Discussion <ul style="list-style-type: none"> ● Low oxygenated and High oxygenated blood separation in the heart 	2 minutes
Conclusion	1 - 2 minutes

Materials Needed

- Clear Glass Cups (3) - The diameter of the glasses should not be too wide.
- Balloons (2) - Big enough to fit over the glass cups
- Clear straw (2)
- Bendy straw (1)
- Scissors
- Water with optional red food coloring
- Electric tape or Masking tape

Instructions for Activity

1. Cut the neck off two balloons. And tape the cut end of the neck closed.
2. Cut a very small slit (enough to insert a straw) in the neck of each balloon about $\frac{1}{2}$ inch below where you taped. Then, insert a clear straw into the slit of one balloon. Set the other balloon aside.
3. Cut the bendy straw so that there is about 1 $\frac{1}{2}$ inches on either side of the bend. Then, cut the other clear straw in half.
4. Tape the bendy straw in between the two half-length straws.
5. Cut two small slits directly across from one another near the top of one of the balloon tops.
6. Insert the long straw and the bendy straw into the two slits.
7. Insert one of the half-length straws from the bendy straw into the slit of the balloon neck you set aside in step 4.
8. Stretch the balloon over the top of the small container with both straws inside of it.
9. Fill one of the cups about $\frac{3}{4}$ full with water. Then, drip about 5 drops of red food coloring into it.
10. Place the cup filled with water on the other end of the bendy straw and the empty cup underneath the other straw. Then, push down on the balloon and watch what happens! This is how the valves in your heart work.

Additional Notes & Tips

- When poking holes in the balloon for the circulatory system model, they will have to be careful!